

FIG. 1

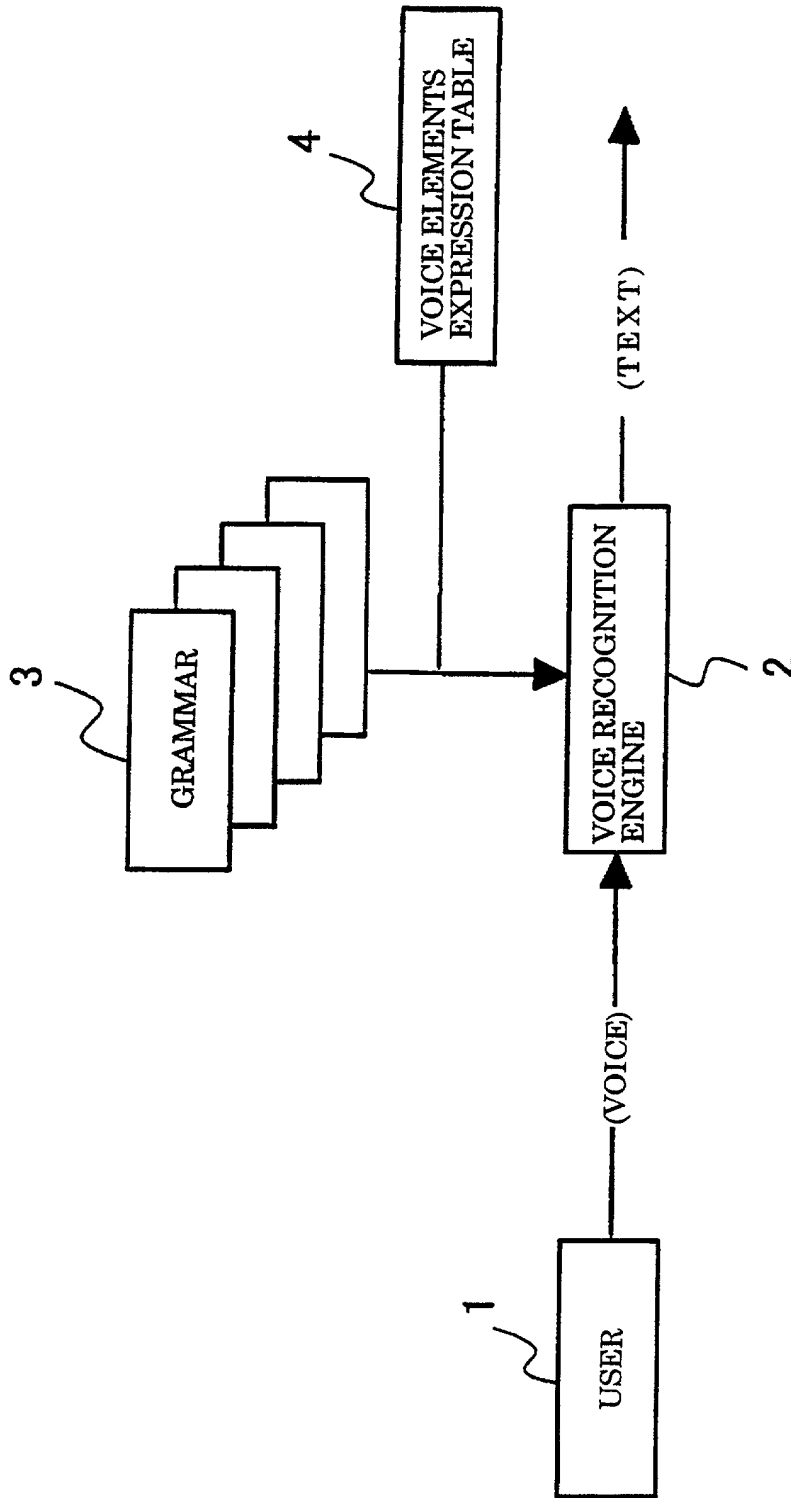


FIG. 2

0 (REI)	ree
0 (REI)	ree:
0 (REI)	rei
0 (ZERO)	zero
1	ichi
2	ni
2	nii
2	nii:
3	sa_n
4 (SHI)	shi
4 (SHI)	shii
4 (SHI)	shii:
4 (YON)	yo_n
5	go
5	go o:
5	gou
6	roku
7 (SHICHI)	hichi
7 (NANA)	nana
7 (SHICHI)	shichi
8	hachi
9 (KU)	ku
9 (KYUU)	kyuu
9 (KYUU)	kyuu:

FIG. 3

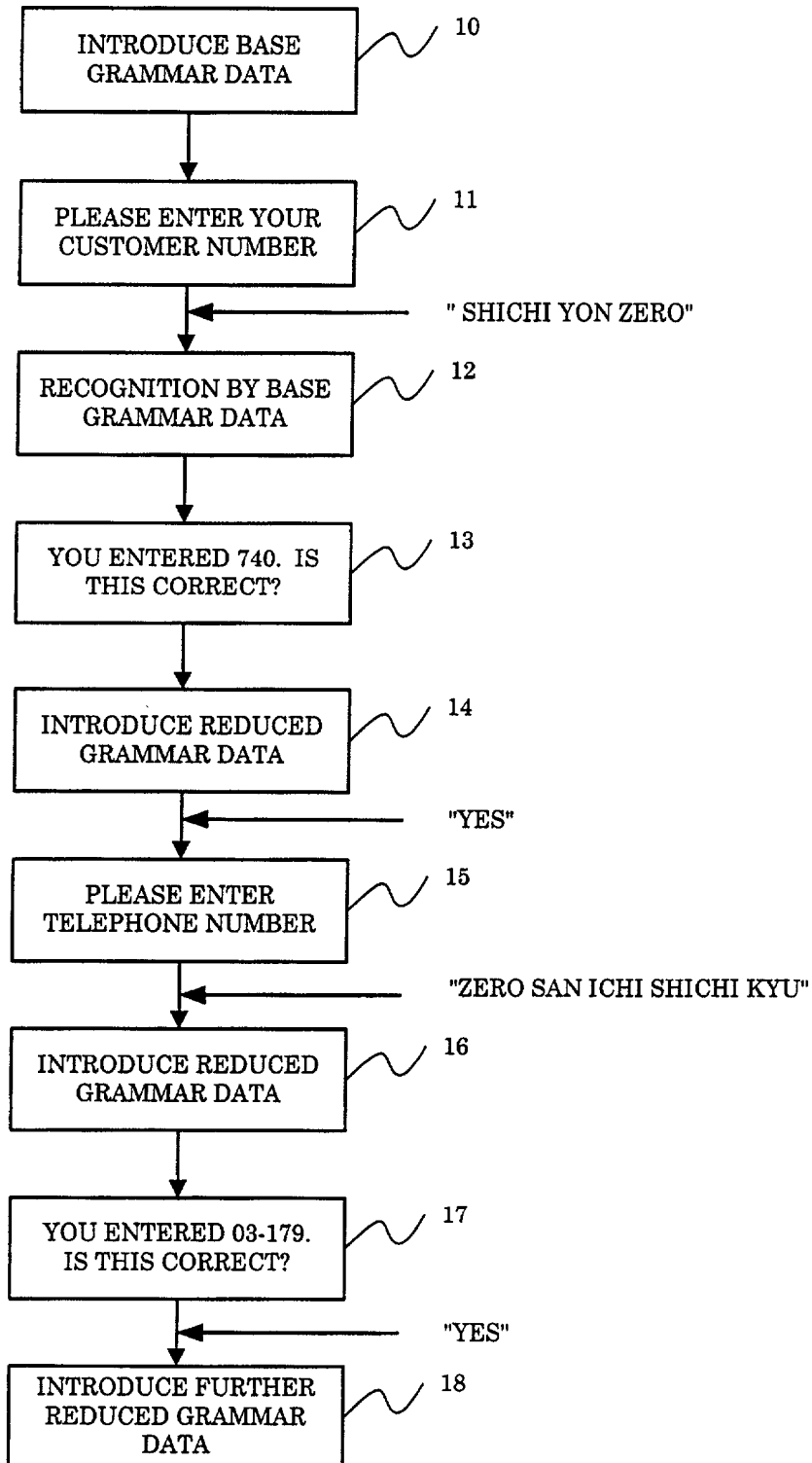


FIG. 4

<digits>::=<num1><num1><num1> .

<num1>=

0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 .

<0> = | z e r o . ← 22

<1> = | i c h i .

<2> = | n i | n i i | n i i .

<3> = | s a _ n .

<4> = | y o _ n . ← 21

<5> = | g o | g o o : | g o u .

<6> = | r o k u .

<7> = | h i c h i | s h i c h i . ← 20

<8> = | h a c h i .

<9> = | k u | k y u u | k y u u : .

FIG. 5

$\langle \text{digits} \rangle ::= \langle \text{num1} \rangle \langle \text{num1} \rangle \langle \text{num1} \rangle .$

$\langle \text{num1} \rangle =$

0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 .

$\langle 0 \rangle = \text{zero} .$

$\langle 1 \rangle = \text{ichi} .$

$\langle 2 \rangle = \text{ni} | \text{nii} | \text{nii} .$

$\langle 3 \rangle = \text{san} .$

$\langle 4 \rangle = \text{yon} .$

$\langle 5 \rangle = \text{go} | \text{goo} : | \text{gou} .$

$\langle 6 \rangle = \text{roku} .$

$\langle 7 \rangle = \text{hichi} | \text{shichi} .$

$\langle 8 \rangle = \text{hachi} .$

$\langle 9 \rangle = \text{kyuu} | \text{kyuu} : .$

← 23

FIG. 6

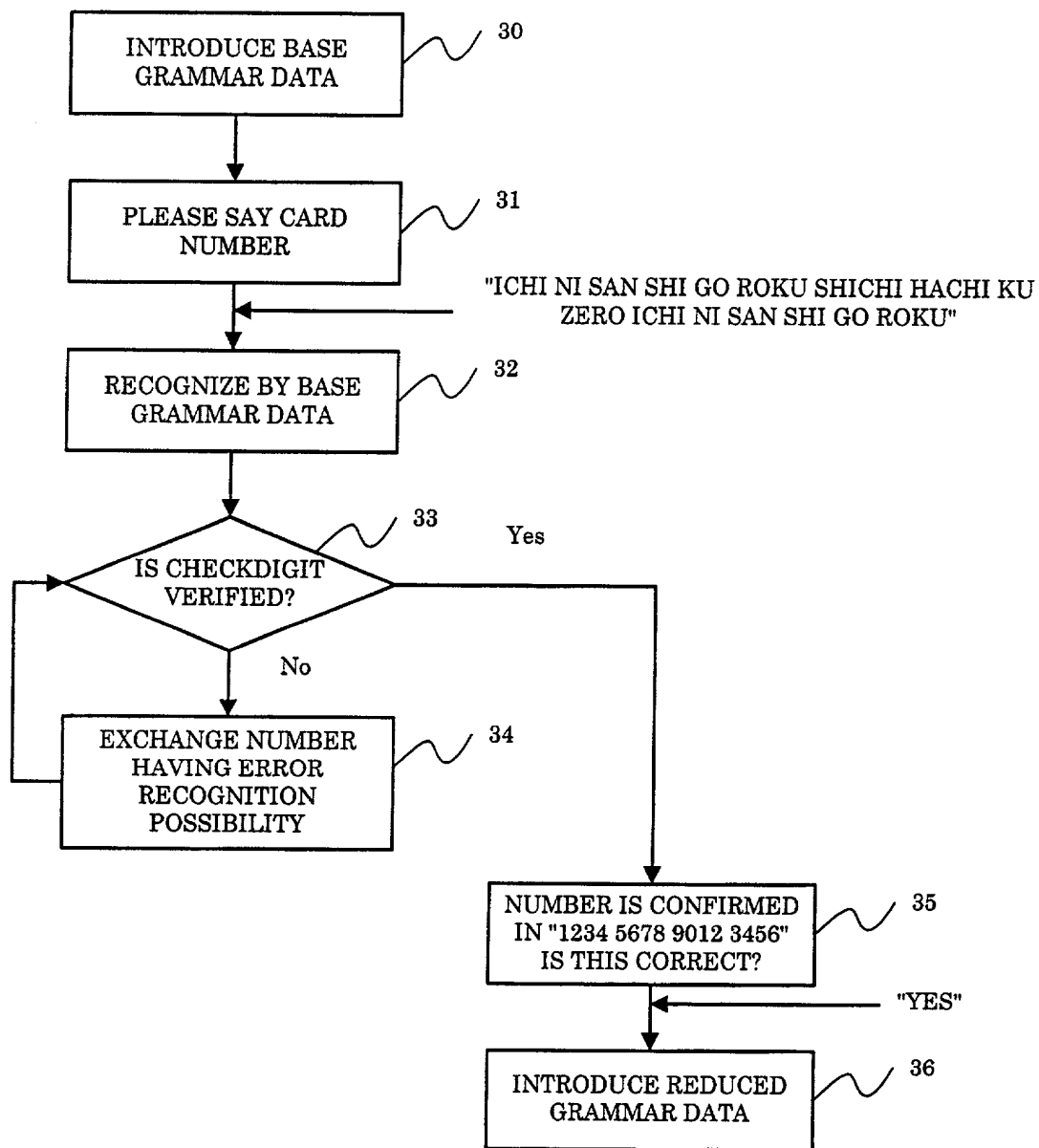


FIG. 7

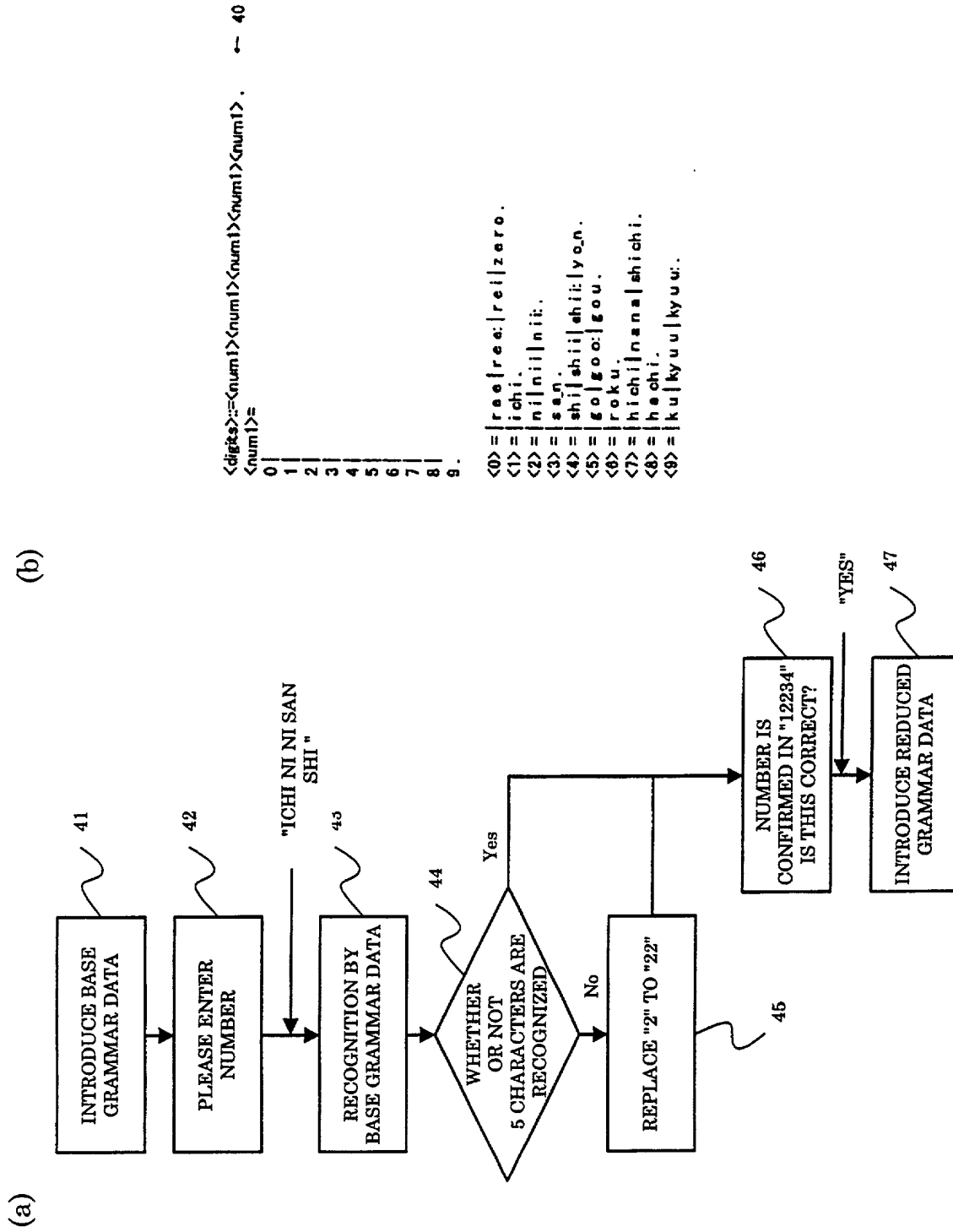


FIG. 8

<digits>::=<num1><num1> .

<num1>=

0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 .

<0> = | zero | zero | zero | <rei> .

<1> = | i c h i .

<2> = | n i | n i i | n i i .

<3> = | s a _ n .

<4> = | s h i | s h i i | s h i i : | y o _ n .

<5> = | g o | g o o : | g o u .

<6> = | r o k u .

<7> = | h i c h i | n a n a | s h i c h i .

<8> = | h a c h i .

<9> = | k u | k y u u | k y u u : .

<rei> = | r e e | r e e : | r e i .

FIG. 9

(a)	$\langle \text{digits} \rangle ::= \langle \text{num1} \rangle \langle \text{num1} \rangle \langle \text{num1} \rangle \langle \text{num1} \rangle$																																																		
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	9 .																																																		
(b)	<table> <tr><td>0</td><td> ree</td></tr> <tr><td>0</td><td> rea:</td></tr> <tr><td>0</td><td> rei</td></tr> <tr><td>0</td><td> zero</td></tr> <tr><td>1</td><td> ichi</td></tr> <tr><td>2</td><td> ni</td></tr> <tr><td>2</td><td> nii</td></tr> <tr><td>2</td><td> nit</td></tr> <tr><td>3</td><td> san</td></tr> <tr><td>4</td><td> shi</td></tr> <tr><td>4</td><td> shii</td></tr> <tr><td>4</td><td> shiit</td></tr> <tr><td>4</td><td> shiit</td></tr> <tr><td>4</td><td> yon</td></tr> <tr><td>5</td><td> go</td></tr> <tr><td>5</td><td> goo</td></tr> <tr><td>5</td><td> gou</td></tr> <tr><td>6</td><td> roku</td></tr> <tr><td>7</td><td> hichi</td></tr> <tr><td>7</td><td> nana</td></tr> <tr><td>7</td><td> shichi</td></tr> <tr><td>8</td><td> hachi</td></tr> <tr><td>9</td><td> ku</td></tr> <tr><td>9</td><td> kyuu</td></tr> <tr><td>9</td><td> kyuu:</td></tr> </table>	0	ree	0	rea:	0	rei	0	zero	1	ichi	2	ni	2	nii	2	nit	3	san	4	shi	4	shii	4	shiit	4	shiit	4	yon	5	go	5	goo	5	gou	6	roku	7	hichi	7	nana	7	shichi	8	hachi	9	ku	9	kyuu	9	kyuu:
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9	ku																																																		
9	kyuu																																																		
9	kyuu:																																																		
(c)	$\langle \text{digits} \rangle ::= \langle \text{num1} \rangle \langle \text{num1} \rangle \langle \text{num1} \rangle \langle \text{num1} \rangle$ $\langle \text{num1} \rangle =$ <table> <tr><td>0 </td><td>$\langle 0 \rangle = \text{ree} \text{rea:} \text{rei} \text{zero.}$</td></tr> <tr><td>1 </td><td>$\langle 1 \rangle = \text{ichi.}$</td></tr> <tr><td>2 </td><td>$\langle 2 \rangle = \text{ni} \text{nii} \text{nit.}$</td></tr> <tr><td>3 </td><td>$\langle 3 \rangle = \text{san.}$</td></tr> <tr><td>4 </td><td>$\langle 4 \rangle = \text{shi} \text{shii} \text{shiit} \text{yon.}$</td></tr> <tr><td>5 </td><td>$\langle 5 \rangle = \text{go} \text{goo} \text{gou.}$</td></tr> <tr><td>6 </td><td>$\langle 6 \rangle = \text{roku.}$</td></tr> <tr><td>7 </td><td>$\langle 7 \rangle = \text{hichi} \text{nana} \text{shichi.}$</td></tr> <tr><td>8 </td><td>$\langle 8 \rangle = \text{hachi.}$</td></tr> <tr><td>9 .</td><td>$\langle 9 \rangle = \text{ku} \text{kyuu} \text{kyuu:}$</td></tr> </table>	0	$\langle 0 \rangle = \text{ree} \text{rea:} \text{rei} \text{zero.}$	1	$\langle 1 \rangle = \text{ichi.}$	2	$\langle 2 \rangle = \text{ni} \text{nii} \text{nit.}$	3	$\langle 3 \rangle = \text{san.}$	4	$\langle 4 \rangle = \text{shi} \text{shii} \text{shiit} \text{yon.}$	5	$\langle 5 \rangle = \text{go} \text{goo} \text{gou.}$	6	$\langle 6 \rangle = \text{roku.}$	7	$\langle 7 \rangle = \text{hichi} \text{nana} \text{shichi.}$	8	$\langle 8 \rangle = \text{hachi.}$	9 .	$\langle 9 \rangle = \text{ku} \text{kyuu} \text{kyuu:}$																														
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